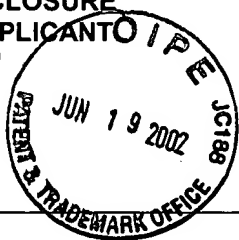


Substitute for form 1449A/PTO

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)



Complete if Known

Application Number	09/901001
Filing Date	July 9, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	1756
Examiner Name	Unknown DUDA

Sheet 2 of 5

Attorney Docket No: 01303.016US1

US-6207222	03/27/2001	Chen, Liang-Yuh, et al	427	97	08/24/1999
US-6211073	04/03/2001	Ahn, K. Y.	438	653	02/27/1998
US-6265311	07/24/2001	Hautala, J J, et al	438	680	04/27/1999
US-6271592	08/07/2001	Kim, E., et al	257	751	08/06/1999

FOREIGN PATENT DOCUMENTS

Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T ²
KUD	JP-07078815	03/20/1995	Miyamoto, I.	H01	217320	abstract only
KUD	JP-5-267643	10/15/1993	Muraoka, T.	H01L	029/46	abstract only

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
KUD		"Brooks Model 5964 High Performance Metal Seal Mass Flow Controller (Introduced in 1991)", <u>Brooks Instrument</u> , http://www.frco.com/brooks/semiconductor/products1i.html , (1991), 1 page	
		ANDRICACOS, P.C., "Copper On-Chip Interconnections", <u>The Electrochemical Society Interface</u> , (1999), pp. 32-37	
		ANONYMOUS, "Improved Metallurgy for Wiring Very Large Scale Integrated Circuits", <u>International Technology Disclosures</u> , 4, Abstract, (1986), 1 page	
		BAE, S., et al., "Low-Temperature Deposition Pathways to Silicon Nitride, Amorphous Silicon, Polycrystalline Silicon, and n type Amorphous Silicon Films Using a High Density Plasma System", <u>IEEE Conference Records---Abstracts, International Conference on Plasma Science</u> , (1997), pg. 315	
KUD		BERNIER, M., et al., "Laser processing of palladium for selective electroless copper plating", <u>SPIE</u> , 2045, (1994), pp. 330-337	
		BHANSALI, S., et al., "A novel technique for fabrication of metallic structures on polyimide by selective electroless copper plating using ion implantation", <u>Thin Solid Films</u> , 270, No. 1/02, (1995), pp. 489-492 ✓	
		BHANSALI, S., et al., "Selective electroless copper plating on silicon seeded by copper ion implantation", <u>Thin Solid Films</u> , 253, (1994), pp. 391-394	
		BRAUD, F., "Ultra Thin Diffusion Barriers for Cu Interconnections at The Gigabit Generation and Beyond", <u>VMIC Conference Proceedings</u> , (1996), pp. 174-179 ✓	
		CABRERA, A.L., et al., "Oxidation protection for a variety of transition metals and copper via surface silicides formed with silane containing atmospheres", <u>J. Mater. Res.</u> , 6(1), (1991), pp. 71-79	
		DE FELIPE, T.S., et al., "Electrical Stability and Microstructural Evolution in Thin Films of High Conductivity Copper Alloys", <u>IEEE</u> , (1999), pp. 293-295	
		DING, "Copper Barrier, Seed Layer and Planarization Technologies", <u>VMIC Conference Proceedings</u> , (1997), pp. 87-92	
KUD		DUBIN, V.M., et al., "Selective and Blanket Electroless Copper Deposition for	

EXAMINER

K. Duda

DATE CONSIDERED

5-2-03

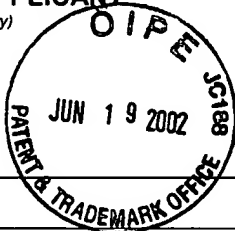
F-CEIVED
JUN 24 2002
TC 1700

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)



Complete if Known

Application Number	09/901001
Filing Date	July 9, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	1756
Examiner Name	Unknown DUDA

Sheet 3 of 5

Attorney Docket No: 01303.016US1

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
		Ultralarge Scale Integration", J. Electrochem. Soc., 144(3), (1997), pp. 898-908	
KAD		DUSHMAN, S., et al., Scientific Foundations of Vacuum Technique, 2nd Edition, John Wiley and Sons, (1962), 1-806	
KAD		EDELSTEIN, D., "Full Copper Wiring in a Sub-0.25 micrometer CMOS ULSI Technology", IEDM, (1997), pp. 773-776	
KAD		ELDRIDGE, J.M., "New Approaches for Investigating Corrosion in Thin Film Devices", Electronic Packaging and Corrosion in Microelectronics, PROCEEDINGS of ASM's Third Conference on Electric Packaging: Materials and Processes & Corrosion in Microelectronics, Mpls, MN, (1987), pp. 283-285	
KAD		FUKUDA, T., et al., "0.5 -micrometer-Pitch Copper-Dual-Damascene Metallization Using Organic SOG (k=2.9) for 0.18-micrometer CMOS Applications", IEEE, (1999), pp. 619-622	
		GLADLFELTER, W.L., et al., "Trimethylamine Complexes of Alane as Precursors for the Low-Pressure Chemical Vapor Deposition of Aluminum", Chemistry of Materials, 1, (1989), pp. 339-343	
		GODBEY, D.J., et al., "Copper Diffusion in Organic Polymer Resists and Inter-level Dielectrics", Thin Solid Films, 308-309, (1997), pp. 470-474	
		GRIMBLAT, J., et al., "II. Oxidation of Aluminum Films", J. Electrochem., 129, (1982), pp. 2369-2372	
		HATTANGADY, S.V., et al., "Integrated processing of silicon oxynitride films by combined plasma and rapid-thermal processing", J. Vac. Sci. Technol. A, 14(6), (1996), pp. 3017-3023	
KAD		HIRATA, A., et al., "WSiN Diffusion Barrier Formed by ECR Plasma Nitridation for Copper Damascene Interconnection", 16th Solid State Devices and Materials, (1998), pp. 260-261	
		HOLLOWAY, K., et al., "Tantalum as a diffusion barrier between copper and silicon", Appl. Phys. Lett., 57(17), (October 1990), pp. 1736-1738	
		HU, C.K., et al., "Extendibility of Cu Damascene to 0.1 micrometer Wide Interconnections", Mat. Res. Soc. Symp. Proc. 514, (1998), pp. 287-292	
		HYMES, S., et al., "Passivation of Copper by Silicide Formation in Dilute Silane", Conference Proceedings ULSI-VII, (1992), pp. 425-431	
		IIJIMA, T., "Microstructure and Electrical Properties of Amorphous W-Si-N Barrier Layer for Cu Interconnections", 1996 VMIC Conference, (1996), pp. 168-173	
		JEON, Y., et al., "Low-Temperature Fabrication of Polycrystalline Silicon Thin Films by ECR Pecvd", The Electrochemical Society Proceedings, 94(35), (1995), pp. 103-114	
		KAMINS, T.I., "Structure and Properties of LPCVD Silicon Films", J. Electrochem. Soc.: Solid-State Science and Technology, 127, (March 1980), pp. 686-690	
KAD		KEPPNER, H., et al., "The "Micromorph" Cell: A New Way to High-Efficiency-Low-Temperature Crystalline Silicon Thin-Film Cell Manufacturing", Mat. Res.	

EXAMINER

K. Duda

DATE CONSIDERED

5-2-03

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 806. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. † Applicant's unique citation designation number (optional) ‡ Applicant is to place a check mark here if English language Translation is attached

RECEIVED
JUN 24 2002
TC 1700

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)



Complete if Known

Application Number	09/901001
Filing Date	July 9, 2001
First Named Inventor	Ahn, Kie
Group Art Unit	1756
Examiner Name	Unknown DUDA

Sheet 4 of 5

Attorney Docket No: 01303.016US1

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
ICAD		Soc. Symp. Proc., 452, (1997), pp. 865-876	
		KIANG, M., et al., "Pd/Si plasma immersion ion implantation for selective electroless copper plating on SiO ₂ ", <u>Appl. Phys. Lett.</u> , 60, (1992), pp. 2767-2769	
		KISTIAKOWSKY, G.B., et al., "Reactions of Nitrogen Atoms. I. Oxygen and Oxides of Nitrogen", <u>The Journal of Chemical Physics</u> , 27(5), (1957), pp. 1141-1149	
		KLAUS, J.W., "Atomic Layer Deposition of Tungsten Nitride Films Using Sequential Surface Reactions", <u>Journal of the Electrochemical Society</u> , 147(3), (2000), pp. 1175-1181	
		LAURSEN, T., "Encapsulation of Copper by Nitridation of Cu-Ti Alloy/Bilayer Structures", <u>International Conference on Metallurgical Coatings and Thin Films</u> , Abstract No. H1.03, San Diego, CA, (April 1997); pg. 309	
		LEN, V., et al., "An investigation into the performance of diffusion barrier materials against copper diffusion using metal-oxide-semiconductor (MOS) capacitor structures", <u>Solid-State Electronics</u> , 43, (1999), pp. 1045-1049	
		LYMAN, T., et al., "Metallography, Structures and Phase Diagrams", <u>Metals Handbook</u> , 8, American Society for Metals, Metals Park, Ohio, (1989), pgs. 300 & 302	
ICAD		MARCADAL, C., "OMCVD Copper Process for Dual Damascene Metallization", <u>VMIC Conference, ISMIC</u> , (1997), pp. 93-97	
		MILLER, R.D., et al., "Low Dielectric Constant Polyimides and Polyimide Nanofoams", <u>Seventh Meeting of the DuPont Symposium on Polyimides in Microelectronics</u> , (September 1996), pp. 443-473	
		MIN, JAE-SIK, "Metal-Organic Atomic-Layer Deposition of Titanium-Silicon-Nitride Films", <u>Applied Physics Letters</u> , Volume 75, No. 11, (1999), pp. 1521-1523	
		MURARKA, S.P., et al., "Copper Interconnection Schemes: Elimination of The Need of Diffusion Barrier/Adhesion Promoter by the Use of Corrosion Resistant, Low Resistivity Doped Copper", <u>SPIE</u> , 2335, (1994), pp. 80-90	
		NAKAO, S., et al., "Thin and Low-Resistivity Tantalum Nitride Diffusion Barrier and Giant-Grain Copper Interconnects for Advanced ULSI Metallization", <u>Japanese Journal of Applied Physics</u> , 38(4B), (April 1999), pgs. 262-263	
		NEWBOE, B., et al., "Applied Materials Announces First Barrier/Seed Layer System For Copper Interconnects", <u>Applied Materials</u> , http://www.appliedmaterials.com/newsroom/pr-00103.html , (1997), pgs. 1-4	
		OKAMOTO, Y., et al., "Magnetically Excited Plasma Oxynitridation of Si at Room Temperature", <u>Jpn. J. Appl. Phys.</u> , 34, (1995), pp. L955-957	
		RADZIMSKI, Z.J., et al., "Directional Copper Deposition using d-c Magnetron Self-sputtering", <u>J. Vac. Sci. Technol. B</u> , 16(3), (1998), pp. 1102-1106	
ICAD		RATH, J.K., et al., "Low-Temperature deposition of polycrystalline silicon thin films by hot-wire CVD", <u>Solar Energy Materials and Solar Cells</u> , 48, (1997), pp. 269-277	

EXAMINER

K. Duda

DATE CONSIDERED

5-2-03

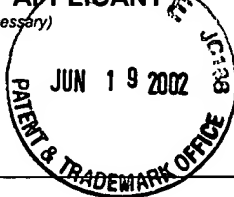
Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)



Complete if Known

Application Number	09/901001
Filing Date	July 9, 2001
First Named Inventor	Ahn, Kie #2
Group Art Unit	1756
Examiner Name	Unknown Duda

Sheet 1 of 5

Attorney Docket No: 01303.016US1

US PATENT DOCUMENTS

Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
KUD	US-2842438	07/08/1958	Saarivirta, M. J., et al	75	153	08/02/1956
KUD	US-4565157	01/21/1986	Brors, D. L., et al	118	719	03/29/1983
KUD	US-4762728	08/09/1988	Keyser, T., et al	427	38	11/26/1985
	US-4847111	07/11/1989	Chow, Yu C., et al	427	38	06/30/1988
	US-4962058	10/09/1990	Cronin, J. E., et al	437	187	04/14/1989
	US-5084412	01/28/1992	Nakasaka, Yasushi	437	189	10/01/1990
	US-5130274	07/14/1992	Harper, J. M., et al	437	195	04/05/1991
	US-5158986	10/27/1992	Cha, S. W., et al	521	82	04/05/1991
	US-5173442	12/22/1992	Carey, D. H.	437	173	03/24/1992
	US-5231056	07/27/1993	Sandhu, G. S.	437	200	01/15/1992
	US-5240878	08/31/1993	Fitzsimmons, J., et al	437	187	04/26/1991
	US-5371042	12/06/1994	Ong, E.	437	194	06/16/1992
KUD	US-5413687	05/09/1995	Barton, C. L., et al	204	192.14	11/27/1991
	US-5609721	03/11/1997	Tsukune, A., et al	156	646.1	01/03/1995
	US-5654245	08/05/1997	Allen, Gregory Lee	438	629	03/23/1993
	US-5670420	09/23/1997	Choi, Kyeong Kenn	437	189	11/08/1995
	US-5763953	06/09/1998	Iijima, T., et al	257	762	01/18/1996
	US-5824599	10/20/1998	Schacham-Diamond, Yosef, et al	438	678	01/16/1996
	US-5891797	04/06/1999	Farrar, P. A.	438	619	10/20/1997
	US-5948467	09/07/1999	Nguyen, T., et al	427	99	07/24/1998
	US-5962923	10/05/1999	Xu, Z., et al	257	774	08/07/1995
	US-5972179	10/26/1999	Chittipeddi, et al	204	192.17	09/30/1997
KUD	US-5994777	11/30/1999	Farrar, P. A.	257	758	08/26/1998
	US-6015465	01/18/2000	Kholodenko, A., et al	118	719	04/08/1998
	US-6017820	01/25/2000	Ting, C. H., et al	438	689	07/17/1998
	US-6065424	05/23/2000	Shacham-Diamond, Y., et al	118	696	12/18/1996
	US-6071810	06/06/2000	Wada, Junichi, et al	438	635	12/23/1997
	US-6136095	10/24/2000	Xu, Z., et al	118	719	10/06/1997
	US-6139699	10/31/2000	Chiang, T., et al	204	192.15	05/27/1997
	US-6140228	10/31/2000	Shan, E., et al	438	653	11/13/1997
	US-6143646	11/07/2000	Wetzel, J. T.	438	637	06/03/1997
	US-6153507	11/28/2000	Mikagi, K.	438	618	01/13/1998
KUD	US-6171661	01/09/2001	Zheng, B., et al	427	535	02/25/1998
	US-6177350	01/23/2001	Sundarrajan, A., et al	438	688	04/14/1998
	US-6183564	02/06/2001	Reynolds, G. J., et al	118	719	11/12/1998
	US-6190732	02/20/2001	Omstead, et al	118	729	
KUD	US-6197688	03/06/2001	Simpson, Cindy Reidsema	438	678	02/12/1998

EXAMINER

K. Duda

DATE CONSIDERED

5-02-03

RECEIVED
JUN 24 2002

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**

(Use as many sheets as necessary)



Complete if Known

Application Number 09/901001

Filing Date July 9, 2001

First Named Inventor Ahn, Kie

Group Art Unit 1756

Examiner Name Unknown DUDA

Sheet 5 of 5

Attorney Docket No: 01303.016US1

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²
KAD		RAY, S.K., et al., "Flourine-enhanced nitridation of silicon at low temperatures in a microwave plasma", <u>J. Appl. Phys.</u> , 70(3), (1991), pp. 1874-1876	
		ROSSNAGEL, S.M., et al., "Metal ion deposition from ionized magnetron sputtering discharge", <u>J. Vac. Sci. Technol. B</u> , 12(1), (1994), pp. 449-453	
		RYAN, J.G., "Copper Interconnects for Advanced Logic and DRAM", Extended Abstracts of the 1998 International Conference on Solid-State Devices and Materials, Hiroshima, (1998), pp. 258-259	
		RYU, C., et al., "Barriers for copper interconnections", <u>Solid State Technology</u> , (April 1999), pp. 53, 54, 56	
		SAARIVIRTA, J., "High Conductivity Copper Rich Cu-Zr Alloys", <u>Transactions of the Metallurgical Society of AIME</u> , 218, (1960), pp. 431-437	
		SENZAKI, Y., "Chemical Vapor Deposition of Copper using a New Liquid Precursor with Improved Thermal Stability", <u>Conference Proceedings ULSI XIII</u> , Materials Research Society, (1998), pp. 451-455	
KAD		SHACHAM-DIAMOND, Y., et al., "Copper electroless deposition technology for ultra-large-scale-integration (ULSI) metallization", <u>Microelectronic Engineering</u> , 33, (1997), pp. 47-58	
		STROUD, P.T., et al., "Preferential deposition of silver induced by low energy gold ion implantation", <u>Thin Solid Films</u> , Switzerland, Vol. 9, No. 2, XP000993098, (Feb. 1972), 273-281	
		TSUKADA, T., et al., "Adhesion of copper films on ABS polymers deposited in an internal magnet magnetron sputtering system", <u>J. Vac. Sci. Technol.</u> , 16(2), (1979), 348-351	
		VENKATESAN, S., et al., "A High Performance 1.8V, 0.20 micrometer CMOS Technology with Copper Metalization", <u>IEEE</u> , (1997), pp. 769-772	
		VOSSSEN, J.L., et al., <u>Thin Film Processes II</u> , Academic Press, Inc., (1991), 1-866	
		WANG, K., et al., "Very Low Temperature Deposition of Polycrystalline Silicon Films with Micro-Meter-Order Grains on SiO ₂ ", <u>Mat. Res. Soc. Symp. Proc.</u> , 355, (1995), pp. 581-586	
		WINTERS, H.F., et al., "Influence of Surface Absorption Characteristics on Reactivity Sputtered Films Grown in the Biased and Unbiased Modes", <u>J. Appl. Phys.</u> , 43(3), (1972), pp. 794-799	
		YEH, J.L., et al., "Selective Copper plating of Polysilicon Surface Micromachined Structures", <u>Solid-State Sensor and Actuator Workshop</u> , (1998), pp. 248-251	
KAD		ZHANG, J., et al., "Investigations of photo-induced decomposition of palladium acetate for electroless copper plating", <u>Thin Solid Films</u> , 318, (1998), pp. 234-238	

EXAMINER

K. Duda

DATE CONSIDERED

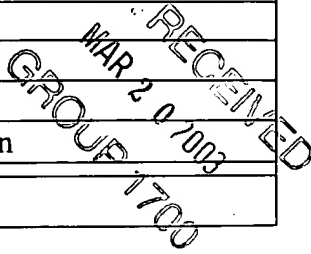
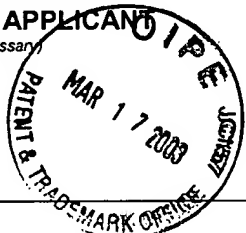
5-2-03

Substitute Disclosure Statement Form (PTO-1449)

* EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 809. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. 1 Applicant's unique citation designation number (optional) 2 Applicant is to place a check mark here if English language Translation is attached

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

Substitute for form 1449A/PTO INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Use as many sheets as necessary)	Complete if Known	
	Application Number	09/901001
	Filing Date	July 9, 2001
	First Named Inventor	Ahn, Kie
	Group Art Unit	1756
	Examiner Name	Duda, Kathleen
Sheet 1 of 1	Attorney Docket No: 1303.016US1	



US PATENT DOCUMENTS						
Examiner Initial *	USP Document Number	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	Filing Date If Appropriate
KND	US-4,394,223	07/19/1983	Hall, Dean	204	15	10/06/1981
KND	US-5,034,799	07/23/1991	Tomita, K. , et al.	357	71	02/14/1990
KND	US-6,140,234	10/31/2000	Uzoh, Cyprian , et al.	438	678	01/20/1998
KND	US-6,372,622	04/16/2002	Tan, , et al.	438	612	10/26/1999
KND	US-6,387,542	05/14/2002	Kozlov, Alexander , et al.	428	673	07/06/2000
KND	US-6,403,481	06/11/2002	Matsuda, T. , et al.	438	687	08/10/1999

FOREIGN PATENT DOCUMENTS						
Examiner Initials*	Foreign Document No	Publication Date	Name of Patentee or Applicant of cited Document	Class	Subclass	T ²

OTHER DOCUMENTS -- NON PATENT LITERATURE DOCUMENTS			
Examiner Initials*	Cite No ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T ²

EXAMINER K. Duda

DATE CONSIDERED 5-5-03